Boulder
1060 STEREO AMPLIFIER

Boulder 1060
300 W
Stereo Power Amplifier

Owners Manual

4/11/04

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Boulder 1060 Power Amplifier Rear Panel

TABLE OF CONTENTS

GETTING STARTED

- Placement of the 1060 Power Amplifier 1-1
- Connecting to the Mains Outlet 1-2
- Connecting a Balanced Source 1-3
- Connecting an Unbalanced Source 1-4
- Polarity 1-5
- Connecting your Loudspeakers 1-5

OPERATION

- Powering Up 2-1
- Input DC Offset Voltage Detection 2-2
- Clip Detection 2-2
- Shorted Output Detection 2-3
- Thermal Protection 2-3
- Maintenance 2-3

REMOTE CONTROL OPERATION

- Remote Control Operation 3-1

BOULDERLINK

- Connecting the Boulderlink 4-1
- Setting Boulderlink Switches 4-2
- Setting Boulderlink ID Numbers 4-2
- Power Up via Boulderlink 4-3
- Boulderlink Messages 4-4

APPENDIX

Specifications 5-1
Troubleshooting 5-2
Notes 5-3

GETTING STARTED

PLACEMENT OF THE 1060 POWER AMPLIFIER

Your Boulder 1060 Power Amplifier is designed to reduce interference from external magnetic and radio fields (RF). While placement is not critical, known magnetic fields should be avoided.

Because the power amplifier is heavy, a solid, stable surface should be used.

As it will generate some heat, there should be good air circulation around it. In particular, make certain that the heat sinks are not blocked.

You may want to have some access to the rear panels for cable changes.

It is recommended to keep the speaker cables as short as possible and have the input cables as long as necessary.

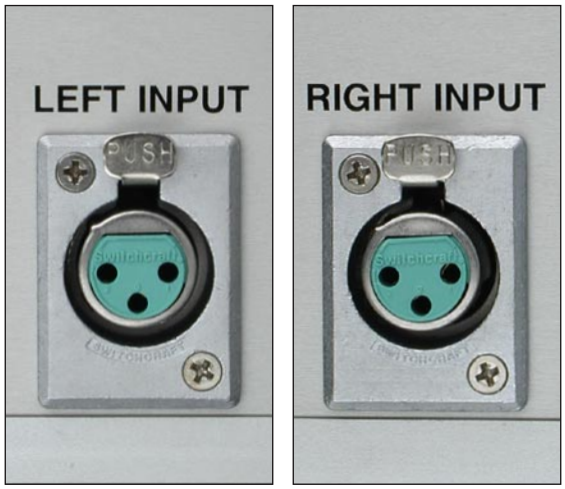
CONNECTING TO THE MAINS OUTLET

Your 1060 Power Amplifier is supplied with a mains cord suitable to the location where it was purchased. It is constructed of a large enough wire gauge and a cable plug appropriate for the voltage you intend to use. Do not substitute another power cable.

The voltage appears in a small window on the rear panel. If you require a different mains voltage, consult your dealer or contact the factory.

Exact voltage and frequency compatibility is stated in the specifications section.

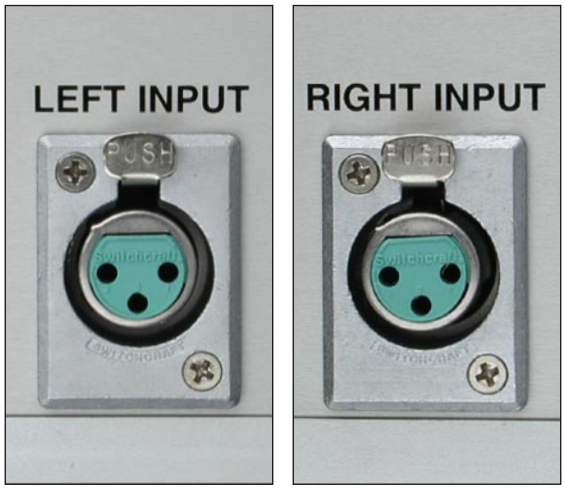
Once the 1060 Power Amplifier is connected to a live mains outlet, the indicator will be illuminated. The indicator will be of varying color, showing that the supervising microprocessor is powered up and ready.



CONNECTING A BALANCED SOURCE

To fully realize the sonic potential of your 1060 Power Amplifier, use balanced connections whenever possible. Balanced cables reduce interference from magnetic and RF sources to an absolute minimum.

Connect your preamplifier outputs to the inputs provided.



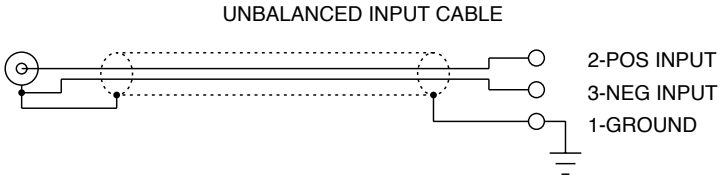
CONNECTING AN UNBALANCED SOURCE

Although the inputs are of the 3 pin type, an unbalanced source is easily accommodated by using a special cable. This cable has an RCA phono type connector on the source end and a 3 pin connector for going to the input of the 1060 Power Amplifier.

The minus input (pin 3) should be wired to ground only at the RCA phono connector. This brings the minus input reference of the 1060 to the unbalanced source ground, thus reducing ground loops.

Another option for accommodating unbalanced sources is that of the Boulder ABL2 Input Adapter. It converts a balanced input into a RCA phono input right at the rear of the 1060.

Like the above cable, the minus input of the 1060 is connected to the ground of the RCA phono. However, this minus side will then share the shield wire with the chassis ground and will not have very good hum rejection.



POLARITY

Please note that the 1060 Power Amplifier conforms to the standard of pin 2 as the high or hot pin for the balanced inputs.

The polarity of the 1060 Power Amplifier is such that a positive-going transition at pin 2 will produce a positive-going transition at the "+" output terminal.

CONNECTING YOUR LOUDSPEAKERS

Do not use any wrenches on the loudspeaker binding posts. Tighten these connectors only by hand.

WARNING: This is a high power amplifier. When driven, there is a high voltage potential at the terminals.

Connections should be made with the mains disconnected.

Select spade terminals which accept 6 mm or .250 inch diameter binding posts. Two sets of output connections are provided to enable easy passive biamping.

There is no provision for the use of banana plugs. These plugs have been proven to come loose over time which increases the contact resistance and distortion. For the same reasons we also do NOT recommend the use of banana plugs at the speaker end.

OPERATION

POWERING UP

With all your connections made, you are ready to listen to your Boulder 1060 Power Amplifier.

To turn the amplifier on, press the POWER button on the front panel. The amplifier will perform a warm up cycle and the indicator will alternate between red and amber for 45 seconds. This power up sequence is mandatory, and cannot be avoided.

Because of the large inrush currents associated with the powerful dual toroidal transformers, four power relays are used to turn on the amplifier. These are under the control of the supervising microprocessor. During the power up sequence, you will hear 2 relay clicks followed by an additional 2 relay clicks after 2 seconds.

The indicator will then turn amber and stay so during normal operation.

To turn the amplifier off, press the POWER button again. The indicator will continuously change from red to green.

INPUT DC OFFSET VOLTAGE DETECTION

The Boulder 1060 Power Amplifier is a direct-coupled power amplifier with a servo for zeroing out any DC voltage offset coming from the preamplifier or other source connected to the amplifier's input.

If this input DC is sufficient to cause 3 volts or more at the output, a loudspeaker protection circuit will mute the amplifier output by electronically disconnecting itself from the loudspeaker. The power indicator will turn red. This condition will continue until the DC is removed.

If the indicator remains red, it is recommended that the user correct the DC offset of the source device before continuing.

CLIP DETECTION

Clipping of the waveform results when any amplifier is driven at too high a level. A clip detection circuit is included in the 1060 Power Amplifier.

The indicator will indicate clipping by momentarily turning from amber to red. Both voltage and current modes of clipping will be detected, although generally it is only voltage clipping which occurs.

SHORTED OUTPUT DETECTION

If the output of the amplifier becomes shorted, the indicator will turn red and the amplifier will turn off the output stage for about 3 seconds, then very briefly try to turn on again. If the short still exists, this cycle will repeat until the short is removed.

THERMAL PROTECTION

A thermal protection circuit prevents high case temperatures which are unpleasant to the touch and potentially harmful to the amplifier. The thermal cutout circuit will mute the amplifier when the transistor cases reach 85°C, and the indicator will turn red.

If this happens, more ventilation should be provided for the amplifiers.

MAINTENANCE

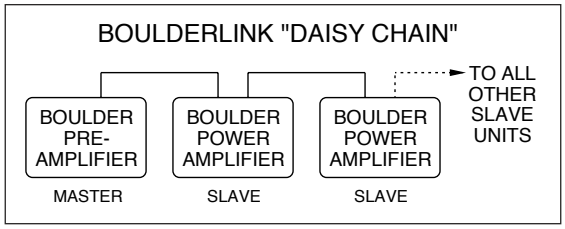
No routine maintenance is required for the Boulder 1060 Power Amplifier. However, to keep operating temperatures at a minimum, do not block the heat sink fins, and remove any dust buildup that may occur.

REMOTE CONTROL OPERATION

Operation of the Boulder 1060 Power Amplifier by remote control is possible when connected by a Boulderlink cable to either the 1012 DAC Preamplifier or the 2010 Preamplifier.

When so connected the 1060 Power Amplifier will be turned on and off with the preamplifier.

REMOTE CONTROL



BOULDERLINK

Boulderlink is a means of interconnecting most Boulder products so that their microprocessors can talk to each other and pass important information. Among the key features, Boulderlink allows sequential initiation of power amplifiers' and other products' power up when the preamplifier is turned on. Boulder power amplifiers can send messages to Boulder Preamplifiers which are then shown on its display.

CONNECTING THE BOULDERLINK

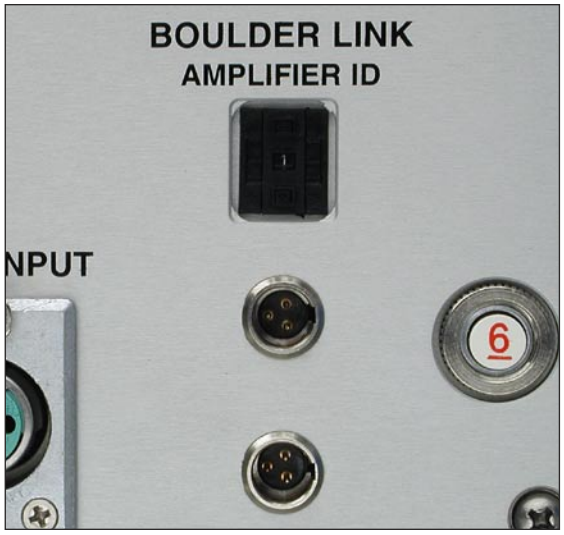
Turn off all products to be linked before connecting Boulderlink cables and setting Boulderlink ID and Master/Slave switches.

Boulderlink cables in various lengths are available as an accessory from your Boulder dealer. Two connectors are provided on the back of the 1060 and other Boulderlink enabled products.

All the chassis are connected together in a daisy chain manner. Start by connecting one chassis to another–then from that chassis to the next until all are connected. The order does not matter.

A special interface may be obtained to enable Boulderlink to be used with other control systems. Contact your Boulder dealer for details.

BOULDER LINK



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SETTING BOULDERLINK SWITCHES

Every Boulderlink system must have one "MASTER" component, and only one component can be set to MASTER. Usually this is the preamplifier. Power amplifiers and other products not having a MASTER/SLAVE switch are not eligible to be "MASTER."

SETTING BOULDERLINK ID NUMBERS

Every component is required to have a unique Boulderlink ID number.

Each Boulder 1060 Power Amplifier has a thumbwheel switch on the rear panel. Start by setting the first switch to 0 or 1 and then going up from there without any duplication. Use of the lowest numbers will speed up turn on as each amplifier is allowed about three seconds before the next. This spreads out the power line inrush currents thus preventing house circuit breakers from unnecessary tripping. Up to 16 power amplifiers may be connected together in one Boulderlink cable daisy chain.

BOULDER LINK

POWER UP VIA BOULDERLINK

With each component connected together with a Boulderlink cable, and individually connected to the mains, pressing the preamplifier's STANDBY pushbutton will initiate the turn on sequence of all components.

The first time a master is powered up, it will search for any "slave" units connected to it. As the master finds each slave, the slave's ID number will be shown on the display.

If any of the connected slaves are amplifiers, then each time the master is turned on it will display "WAITING FOR AMPS." Each amplifier will be turned on in the order of their Boulderlink ID. To minimize turn on time, the amplifier's Boulderlink IDs should be set to the lowest sequential numbers possible. For example, use 0, 1, and 2 instead of 13 , 14, and 15. An amplifier set to ID 15 will take 47 seconds to turn on.

BOULDER
LINK

BOULDERLINK MESSAGES

Each component in the system can send a message to the preamplifier which is then shown on its display. This is particularly helpful in confirming the operating status of each power amplifier in a multiple amplifier system. Typical messages on a 1010 Preamplifier or 1012 DAC Preamplifier are as follows.

"AMPLIFIER 1 ERROR" means that an internal power supply has failed and the amplifier has turned itself off to protect the speakers from damage.

"AMPLIFIER 1 HAS DC" means that it has turned itself off due to a DC offset voltage being detected at its inputs.

"AMPLIFIER 1 IS HOT" means that is has turned itself off due to a higher than normal temperature condition on the heatsinks.

"AMPLFIER CLIP" means that the amplifier's output has momentarily reached its voltage limitation.

"UNIT 1 IS OFFLINE" means that the slave is no longer responding via Boulderlink. Its Boulderlink cable may have become disconnected, or the mains power has been disconnected.

"UNIT 1 IS ONLINE" means that the slave is now responding via Boulderlink in a normal manner and has been recognized by the master.

BOULDER 1060 POWER AMPLIFIER SPECIFICATIONS

THD at Continuous Power, 20 to 2KHz	0.001%
THD at Continuous Power, at 20KHz	0.005%
Continuous Power, 8 Ω	300 W
Continuous Power, 4 Ω	300 W
Continuous Power, 2 Ω	300 W
Peak Power, 8 Ω	300 W
Peak Power, 4 Ω	600 W
Peak Power, 2 Ω	1200 W
Magnitude Response, 20 to 20KHz	+0.00, -0.04 dB
Magnitude Response, -3 dB at	0.015Hz, 150kHz
Voltage Gain	26dB
Signal to Noise Ratio (re: 500W/8Ω)	-127dB, unweighted, 20 to 22kHz
Input Impedance	Balanced: 100KΩ, Unbalanced: 50KΩ
Common Mode Rejection (Balanced only)	60Hz: 90dB, 10kHz: 70dB
Inputs	3-pin Balanced
Output Connectors	2 sets of 6 mm / .250 inch thumbscrews
Crosstalk, L to R or R to L	Greater than 120dB
Size, Inches, W X H X D	18.0W x 9.5H x 22.25D (including connectors, add 7 inches for power connector and cord)
Power Requirements	120, 220-240 VAC 100, 200 VAC (Japan Version) 50-60 Hz, 240 W nominal, 3000 W at maximum output

All specifications taken at 120 VAC mains power

TROUBLESHOOTING		
SYMPTOM	**CAUSE**	**REMEDY**
No power indication	Power switch is not on	Turn on power switch
	Power amplifier is not plugged in	Connect to an AC outlet
	Home circuit breaker is tripped	Reset circuit breaker
Red power indication	Low line voltage	Have line voltage checked
	Power supply's breakers tripped	Reset breakers on rear panel
	Defective power supply cables	Have cables tested
	Defective power supply or preamp	Return to dealer for service
Amber power indication, but sound not heard from one channel	No signal from one channel of source	Check source controls, cables, and connections
	One Channel is muted by balance control	Recenter balance on preamp
	No signal out to power amplifier	Check connections to power amp

NOTES

APPENDIX